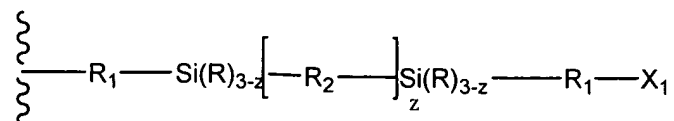


Claims

1. A composite article comprising a polyolefin layer, a tie-layer, and a non-polyolefin, wherein said tie-layer comprises a silicon modified polyolefin.

2. The composite article of claim 1, wherein said tie-layer comprises:



wherein ~ represents a polyolefin segment;

R<sub>1</sub> independently for each occurrence represents an organic or inorganic moiety or a bond;

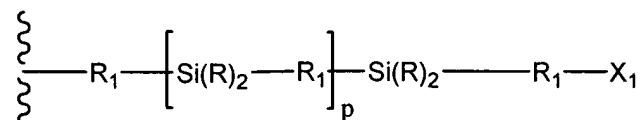
R<sub>2</sub> independently for each occurrence represents an organic moiety, an inorganic moiety, or a bond;

R independently for each occurrence represents an organic or inorganic moiety;

X<sub>1</sub> independently for each occurrence represents an organic or inorganic moiety; and

z represents the number of linkages between the Si(R)<sub>3-z</sub> moieties, and is an integer from 1 to 3.

3. The composite article of claim 1, wherein said silicon modified polyolefin comprises:



wherein ~ represents a polyolefin segment;

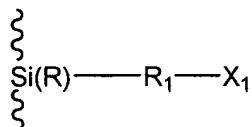
R<sub>1</sub> independently for each occurrence represents an organic or inorganic moiety or a bond;

R independently for each occurrence represents an organic or inorganic moiety;

X<sub>1</sub> independently for each occurrence represents an organic or inorganic moiety; and

p is an integer from 0 to about 1000.

4. The composite article of claim 1, wherein said silicon modified polyolefin comprises



wherein  $\sim$  represents a polyolefin segment;

$\text{R}_1$  independently for each occurrence represents an organic or inorganic moiety or a bond;

$\text{R}$  independently for each occurrence represents an organic or inorganic moiety; and

$\text{X}_1$  independently for each occurrence represents an organic or inorganic moiety.

5. The composite article of claim 2, wherein for each occurrence,  $\text{R}$  is selected independently from the group consisting of H, alkyl, alkenyl, alkynyl, hydroxyl, alkoxy, halogen, aralkyl, aryl, heterocyclyl, polycyclyl, carbocycles, and heteroatoms.
6. The composite article of claim 5, wherein  $\text{R}$  is  $\text{-O-alkyl}$  or  $\text{O-H}$ .
7. The composite article of claim 2, wherein for each occurrence,  $\text{R}_1$  and  $\text{R}_2$  are selected independently from the group consisting of alkyl, alkenyl, and alkynyl,  $\text{-O-}$ , alkoxy, aryl, heterocyclyl, polycyclyl, carbocycles, and a bond.
8. The composite article of claim 2, wherein  $\text{R}_2$  for each occurrence independently represents an acetyl moiety, alkyl ether, aryether,  $\text{-O-}$ , or a bond.
9. The composite article of claim 8, wherein  $\text{R}$  is selected independently for each occurrence from the group consisting of H, alkyl, alkenyl, alkynyl, hydroxyl, alkoxy, halogen, aralkyl, aryl, heterocyclyl, polycyclyl, carbocycles, and heteroatoms.
10. The composite article of claim 8, wherein  $\text{R}_1$  is selected independently for each occurrence from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, and hydroxyl.
11. The composite article of claim 10, wherein  $z$  is 1.
12. The composite article of claim 10, wherein  $z$  is 2.
13. The composite article of claim 10, wherein  $z$  is 3.
14. The composite article of claim 2, wherein  $\text{X}_1$  represents at least one moiety that is capable of bonding to said non-polyolefin.
15. The composite article of claim 14, wherein  $\text{X}_1$  comprises a vinyl, epoxy or amine moiety.
16. The composite article of claim 3, wherein for each occurrence,  $\text{R}$  is selected independently from the group consisting of H, alkyl, alkenyl, alkynyl, hydroxyl, alkoxy, halogen, aralkyl, aryl, heterocyclyl, polycyclyl, carbocycles, and heteroatoms.

17. The composite article of claim 16, wherein R is -O-alkyl or -O-H.
18. The composite article of claim 3, wherein R<sub>1</sub> is selected independently, for each occurrence, from the group consisting of alkyl, alkenyl, and alkynyl, -O-, alkoxy, aryl, heterocyclyl, polycyclyl, carbocycles, and a bond.
19. The composite article of claim 3, wherein X<sub>1</sub> represents at least one moiety that is capable of bonding to said non-polyolefin.
20. The composite article of claim 19, wherein X<sub>1</sub> comprises a vinyl, epoxy or amine moiety.
21. The composite article of claim 4, wherein for each occurrence, R<sub>1</sub> is selected independently from the group consisting of alkyl, alkenyl, and alkynyl, -O-, alkoxy, aryl, heterocyclyl, polycyclyl, carbocycles, and a bond.
22. The composite article of claim 21, wherein X<sub>1</sub> represents at least one moiety that is capable of bonding to said non-polyolefin.
23. The composite article of claim 22, wherein X<sub>1</sub> comprises a vinyl, epoxy or amine moiety.
24. A composite tube, comprising the composite article of claim 1.
25. A composite tube that comprises a polyolefin layer, and a composite layer, wherein the polyolefin layer is bonded to the composite layer through a tie-layer, wherein the tie-layer comprises a silicon moiety.
26. A method for adhering a polyolefin to a non-polyolefin, comprising:
  - providing a silicon modified polyolefin,
  - contacting said silicon modified polyolefin with a coupling agent to form a tie-layer,
  - contacting the tie-layer to a non-polyolefin and a polyolefin to form a composite structure, and
  - exposing the composite structure to conditions sufficient to create adhesion between the polyolefin and the non-polyolefin.
27. The method of claim 26, wherein said coupling agent comprises a silane moiety.
28. A method for adhering a polyolefin to a non-polyolefin, comprising:
  - providing a polyolefin modified with a reactive moiety,
  - contacting the modified polyolefin with a silane coupling agent to form a tie-layer,
  - contacting the tie-layer to a non-polyolefin and a polyolefin to form a composite structure, and

exposing the composite structure to conditions sufficient to create adhesion between the polyolefin and the non-polyolefin.